



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO.   | CONFIRMATION NO. |
|-----------------|-------------|----------------------|-----------------------|------------------|
| 09/848,773      | 05/03/2001  | Qian Chen            | 06666/076001/USC-2892 | 6630             |

20985 7590 06/10/2003  
FISH & RICHARDSON, PC  
4350 LA JOLLA VILLAGE DRIVE  
SUITE 500  
SAN DIEGO, CA 92122

EXAMINER

NGUYEN, KIMBINH T

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2671

DATE MAILED: 06/10/2003

6

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/848,773

Applicant(s)

CHEN ET AL.

Examiner

Kimbinh T. Nguyen

Art Unit

2671

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-63 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-24 and 50-63 is/are allowed.
- 6) ☒ Claim(s) 25-28 and 40-42 is/are rejected.
- 7) ☒ Claim(s) 29-40, 43-49 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

### DETAILED ACTION

1. Claims 1-63 are pending in the application.

#### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 25-28, 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Palm 5,748,199) in view of Chiang et al. (6,477,268).

Claim 25, Palm discloses obtaining first and second images of the same object (col. 19, lines 7-34; fig. 2); identifying objects in the first and second images (identify points on image 1 and image 2; col. 21, lines 44-45), forming lines which intersect the objects (col. 22, lines 54-59); Palm does not suggest aligning the lines in an epipolar geometry; however, Chiang et al. teaches aligning the lines (control lines) in an epipolar geometry (col. 3, line 64 through col. 4, line 2). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the aligning the source image method from Chiang's teaching into the method for converting 2D images into 3D motion images taught by Palm for producing 3D information, because it would provide smooth transitions between a source image and a destination image with overlapping features (col. 3, lines 59-61).

Art Unit: 2671

Claims 26-28, 40, Palm discloses using the first and second images with the aligned lines to form 3D information (col. 33, line 64 through col. 34, line 3) as a surface map indicating 3D for each 2D pixel (col. 33, lines 11-26); storing 3D information measure (col. 33, lines 27-36); converting the surface map into 3D information (col. 33, lines 23-26).

4. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kang (6,061,468) in view of Woodfill et al. (6,456,737).

Claim 41, Kang discloses obtaining information about an image from two uncalibrated cameras (col. 2, lines 37-40); using the information from two uncalibrated cameras to obtain 3D information (col. 3, lines 10-14). Kang teaches using an uncalibrated camera and does not disclose from two uncalibrated camera; however, Woodfill et al teaches receive images from two camera (col. 10, line 16), the cameras may be align improper or the lens distortion may warp each image in a different manner (uncalibrated cameras, col. 16, lines 30-32). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the feature of using two uncalibrated cameras taught by Woodfill's teaching into the 2D images taken by a camera taught by Kang for reconstruction a 3D object, because it would improve correspondence algorithm, hardware designed to efficiently and inexpensively perform (col. 3, lines 34-35).

5. Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kang (6,061,468) in view of Woodfill et al. (6,456,737) and further in view of Szeliski et al. (5,917,937).

Claim 42, Kang does not teach rectifying the image; however, Szeliski et al. discloses rectifying the image to form coplanar images with scan lines are horizontally parallel (col. 8, lines 61-64). It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the method of rectifying the image from Szeliski's teaching into the reconstructing 3D images taught by Kang's method for forming coplanar images, because it would implement for mapping from screen coordinates to world coordinates (col. 8, lines 30-31).

***Allowable Subject Matter***

6. Claims 1-24 and 50-63 allowed.

The following is a statement of reasons for allowance:

The prior art does not disclose superimposing lines formed on the images to rectify the two images relative to one another to form rectified images; using the rectified images to form 3D information; forming a disparity map of 3D for specified coordinates of matching pixels by forming a plurality of areas, finding seed voxels in areas which have relatively high probability of being correct matches and propagating to other pixels from the seed voxels.

7. Claims 29-40, 43-49 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

Art Unit: 2671

The prior art does not disclose rectifying comprises identifying points in each of the images, and identifying scan lines which pass through the points; identifying at least one seed voxel, with a relatively high probability of being a correct 3D measure.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Kimbinh Nguyen** whose telephone number is **(703) 305-9683**. The examiner can normally be reached **(Monday- Thursday from 7:00 AM to 4:30 PM and alternate Fridays from 7:00 AM to 3:30 PM)**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached at (703) 305-9798.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

**Or faxed to:**

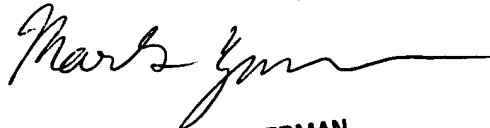
**(703) 872-9314 (for Technology Center 2600 only)**

Hand-delivered responses should be brought to Crystal Part II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

Kimbinh Nguyen

May 30, 2003

  
MARK ZIMMERMAN  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600